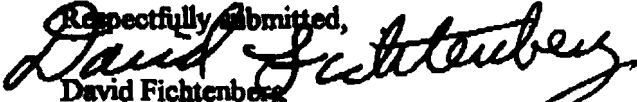


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Respectfully submitted,

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M.A. Biostatistics, Master of Public Health

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 8, 1996.


David Fichtenberg

Submitting one original and fourteen copies to the Secretary, Federal Communications Commission, 1919 M Street, N.W., Room 222, Washington D.C., 20554
Plus copies to Petitioner



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 8 1996

OFFICE OF
AIR AND RADIATION

David Fichtenberg
P.O. Box 7577
Olympia, WA 98507-7577

Dear Mr. Fichtenberg:

Thank you for your E-mail letter of October 2, 1996, that asks for clarification of a statement in the letter (July 25, 1996) from Environmental Protection Agency (EPA) Administrator Carol M. Browner to Federal Communications Commission (FCC) Chairman Reed E. Hundt. You request explanation of the statement, "this new approach is consistent with our comments made in 1993 and addresses our concerns about adequate protection of public health," with questions that pertain to acute thermal exposures, long-term (chronic) nonthermal exposures, and specific absorption rate (SAR).

Let us review the FCC's approach to developing new guidelines. The EPA discussion of the original FCC Notice of Proposed Rulemaking, "Guidelines for Evaluating the Environmental Effects of Radio frequency (RF) Radiation, ET Docket No. 93-62," resulted in recommendations to the FCC (November 9, 1993). One of those recommendations was that the FCC adopt the exposure criteria recommended by the National Council on Radiation Protection and Measurements (NCRP) in NCRP Report No. 86, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," instead of the 1992 ANSI/IEEE standard that was originally proposed.

The FCC concluded its rule-making activity in August 1996, and adopted RF radiation exposure limits that are generally based on the NCRP guidelines as was recommended by EPA. In addition, the FCC specified that the limits are based on exposure limits quantified in terms of specific absorption rate, and that the SAR limit is 4 watts per kilogram (W/kg).

EPA was very specific in our 1993 comments regarding the sufficiency of available information (on the health effects of RF radiation) to provide a basis for developing exposure standards. In the context of those comments, the FCC's resulting rule that generally followed the NCRP guidelines, and the FCC's explicit statement that the limits adopted are based on the SAR limit of 4 W/kg, EPA believes that our concerns about adequate protection of public health were addressed by the FCC. The FCC does not claim that their new exposure guidelines provide protection for effects to which the 4W/kg SAR basis does not apply.

A key conclusion of EPA's Radio frequency Radiation Conference, April 1993 (see "Summary and Results of the April 26-27, 1993, Radio frequency Radiation Conference," Vol. I: Analysis of Panel Discussions, EPA Report 402-R-95-009, March 1995) is that "There is sufficient information on thermal exposure/effects on which to base a standard. However, participants generally felt that more information needs to be obtained on nonthermal effects." This is reflected in EPA's November 1993 comments to the FCC. These include the following:

"While studies continue to be published describing biological responses to nonthermal ELF-modulated RF radiation, the effects information is not yet sufficient to be used as a basis for exposure criteria to protect the public against adverse human health effects."

"It is clear that the adverse effect threshold of 4 W/kg is based on acute exposures (measured in minutes or a few hours) that elevate temperature in laboratory animals including nonhuman primates, and not on long-term, low-level (non-thermal) exposure. Only a few chronic exposure studies of laboratory animals and epidemiological studies of human populations have been reported. The majority of these relatively few studies indicate no significant health effects are associated with chronic, low-level exposure to RF radiation. This conclusion is tempered by the results of a small number of reports suggesting potentially adverse health effects (cancer) may exist (...).

"The thesis that the 1992 ANSI/IEEE recommendations are protective of all mechanisms of interaction is unwarranted because the adverse effects level in the 1992 ANSI/IEEE standard is based on a thermal effect."

"While there is general, although not unanimous, agreement that the data base on low-level, long-term is insufficient to provide a basis for standards development, some contemporary guidelines state explicitly that their adverse-effect level is based on an increase in body temperature (NRPB 1993). Furthermore they do not claim that the exposure limits protect against both thermal and nonthermal effects."

With this background established, I will proceed to provide my responses to your other questions.

Q. Is it correct to conclude that the "adequate protection of public health" noted above, refers to "protecting against thermally related effects in humans?"

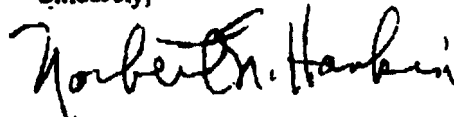
A. As I have previously noted, while there is sufficient information on thermal exposure/effects on which to base a standard, the data base on low-level, long-term exposure is insufficient to provide a basis for standards to protect the public against adverse human health effects that may result from long-term, nonthermal exposures. Both the NCRP and ANSI/IEEE standards are thermally based, and do not apply to chronic, nonthermal exposure situations. The statement referring to "adequate protection" pertains to thermally related effects.

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- Q. Is it still correct that adverse effect level of 4 W/kg is based on acute exposures that elevate temperature in laboratory animals including nonhuman primates, and not on long-term, low-level (non-thermal) exposure.
- A. Yes
- Q. Is it correct that the "adequate protection" EPA refers to in its July 25, 1996 letter pertains to protection provided for the effects which occurred due acute exposures, and not necessarily to effects reported to occur below the 4W/kg threshold level?
- A. We are referring to exposures that are acute, thermal exposures, not non-thermal, chronic exposures. The SAR limit to which the whole-body exposure limits for the public are related is 0.08 W/kg due to the use of a factor of 50 uncertainty factor applied to the 4 W/kg basis.
- Q. Is it correct that "adequate protection" of public health: pertains to thermally related health effects, and not necessarily to the nonthermal effects noted in the 1993 EPA letter?
- A. Yes
- Q. In view of 1993 comments, does adequate protection pertain to microwave hearing?
- A. In that the 'microwave hearing effect' has not been established as a health effect, our statement with regard to "adequate protection" would not pertain to microwave hearing.

I hope that this information has been helpful and responsive to your inquiry. Please contact me if I can be of further assistance.

Sincerely,



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PROPERTY MANAGEMENT

21 March 1996

Cell phone Transmitters on School Sites - Policy Statement

From 1982 it has been possible for Boards of Trustees to enter into agreements with Telecom for the establishment of cell phone transmitters on schools sites. The decision to install a transmitter on a school site was left entirely at the boards discretion.

In December 1994 concerns were expressed by some members of the general public and some boards of trustees and parents about the safety of cell phone transmitters on school sites.

The National Radiation Laboratory expressed the view that:

- Cell phone transmitters operate well within the New Zealand Standard 6609 for UHF and microwave electromagnetic radiation levels.
- With few exceptions, nearby residents of cell phone base stations are exposed to levels less than 1% of the general public exposure limit set out in the New Zealand Standard 6609.
- There is no conclusive evidence that short or long term exposures at these low levels are harmful.

However of paramount importance to the Ministry is the provision of an environment where boards of trustees, parents, teachers and pupils and other occupants of the school site can feel comfortable. For this reason the Ministry has decided cellphone transmitters will not be sited on Crown owned school sites in the future.



John Simpson
National Property Manager

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California Public Utilities Commission

NEWS RELEASE

505 Van Ness Avenue San Francisco, CA 94102-3298

CONTACT: Dianne Dienstain November 8, 1995 CPUC -102
415-703-2423 (1.91-01-012)

CPUC REMAINS WATCHFUL REGARDING RF/EMF FROM CELLULAR TOWERS

The California Public Utilities Commission (CPUC) today ordered cellular utilities to identify and address public concerns about potential health problems from electromagnetic field (EMF) and radio-frequency (RF) exposure in siting and building new cellular towers. It urged cellular companies to site facilities away from schools and hospitals, and to restrict access to sites with warning signs and barriers.

The Commission's jurisdiction is limited to cellular towers and related facilities - it does not regulate cellular phones. The federal Food and Drug Administration regulates RF emissions from consumer/industrial devices and is looking into RF emissions from hand-held cellular phones.

Due to public concern and scientific uncertainty regarding the potential health effects of EMF exposure, the Commission examined what steps should be taken to mitigate the health effects, if any, of RF and EMFs from the 1,000 cellular facilities in California. It found no scientific link between EMFs and adverse health effects on humans from cellular facilities.

A steering committee composed of one representative each from the CPUC Commission Advisory and Compliance Division, CPUC Division of Ratepayer Advocates, state Department of Health Services, Cellular Carriers Association of California, and Citizens Concerned About Telecommunications EMF held an EMF informational workshop on July 21, 1993 for interested individuals and organizations. The workshop was videotaped for those who could not attend.

- more -

CPUC REMAINS WATCHFUL REGARDING RF/EMF FROM CELLULAR TOWERS-2-2-2

The workshop report, included with the Commission decision today, identified levels of cellular utilities' EMF and RF radiation impacts, issues for further consideration and interim safety measures.

The Commission will not adopt a specific numeric standard for RF/EMF exposure associated with cellular facilities because it is premature to do so given no scientific evidence of a definite link between cellular facility EMF exposure and adverse health effects.

However, as more scientific research is completed, Commission action may become necessary. The CPUC Commission Advisory and Compliance Division will keep track of cellular EMF/RF research findings and information, advise the Commission if action is needed to address them, and convene periodic workshops to share that information with all interested parties.

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there is stron.
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evidence.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of) ET-Docket No. 93-62
Guidelines for Evaluating the Environmental) and Report and Order FCC 96-326
Effects of Radiofrequency Radiation)

To: The Commission

**Opposition to parts of Petition for Reconsideration of the Department of Defense, US West,
and AT&T Wireless**

1. Introduction. There is evidence that the process for developing IEEE C95.1-1991 was faulty, that its limits above 1500 MHz may have adverse effects, and that its own Final List of Papers Reviewed for the standard show adverse effects below the adverse effects threshold, and other reasons indicate this standard should not be adopted.

2. Judging the claims herein using IEEE 1991 as a standard should be done with caution because the development of this standard has flaws including (a) allowing minority views to be in the standard by requiring a super-majority to delete or modify text prepared by special committees¹¹²; (b) 2 of the 3 balloting committee members from federal health agencies who voted to reject IEEE 1991 gave the reasons: (i) *"not balanced in representing government, industry, and the general public,"* (ii) lacked *"agency review and comment"* of a draft, (iii) had *"very weak justifications"* for exposure increases (iv) *"brushed aside"* important papers showing *"pulsed microwaves may give responses at lower average levels than continuous waves."*^{13,19} (c) Also, while cell-culture studies are often used to suggest possible adverse effects that may support findings from live animal studies; yet IEEE 1991 reported findings, *"indicating effects, in vitro (in cell cultures), on cell function were considered transient and reversible with no detrimental health effects,"* [IEEE 1991 pg. 27] even when authors of some of these studies

concluded otherwise, e.g. "...it is almost certain that these effects would be disruptive of ongoing information handling processes if they were to occur in an intact nervous system."⁶⁹

Thus, it appears good science practices were not followed.

3. The limits of the ANSI/IEEE standard above 1500 MHz allow out-of-compliance SAR conditions.:

It is seen by using Gandhi⁵² that 'occupational/controlled' and "general population/uncontrolled" both need to have exposure limits reduced. Since Gandhi⁵² shows that above 500 MHz the average whole body SAR for an adult man is constant at about 0.08 W/kg for each 1 mW/cm², then at 1500 MHz the average whole body SAR of an average male would be 0.4 W/kg, since the allowed power 1500 MHz / 300 = 5 mW/cm². Consequently, since persons who are smaller than an average male work in the work force, it may be presumed that the 0.4 W/kg is exceeded for such persons and that the limits need to be reduced at these higher frequencies. Since, Commission's rules allow for higher exposure in places of transient passage (e.g. public places where people are in transit, such as bus stops) even small children and infants may be exposed to "occupational/controlled" levels (see R&O #43). Hence, the limits for 'occupational/controlled' also need to be reduced to maintain current basic SAR provisions.

4. IEEE Final List studies/references indicating the 10 mW/cm² power density at upper frequencies is too high - for studies below all frequencies were greater than 15 GHz

4.1 At 8.3 mW/cm² people are expected to feel 'very warm to hot' (Gandhi et al, 1986)¹¹³

4.2 At 1.7 mW/cm² on an arm people perceive warmth within 10 seconds. Longer or shorter durations of exposure ..are often associated with lower or higher thresholds.¹¹⁴

4.3 The ANSI Z136.1-1993 "Safe Use of Lasers" standard states that its limits, which include 10mW/cm² for 300 GHz. "*may be uncomfortable to view or feel upon the skin....maintain exposure levels as far below the (limit values) as is practicable.*"¹¹⁵

4.4 At 17 mW/cm² there was "muscular flaccidity or collapse (of chicks). At 20 mW/cm² there was mild hyperpyrexia below the frontal portion of a rat's skull. (10 mW/cm² of IEEE 1991 has a safety factor, if any, of less than 2 which is quite unusual⁹⁶). (Deichman et al. 1959)¹¹⁶

4.5 At 10 mW/cm² "induced significant leucocytosis, lymphocytosis, and neutrophilia ...Effects on erythrocytes, hemoglobin, and hematocrit differed in the three strains."¹¹⁷

4.6 IEEE 1991 reference [B26] recommended 1 mW/cm² for the general population.⁶⁴

5. **Claims IEEE 1991 limits are 'safe for all' are inconsistent with some of its Final List of Papers Reviewed for IEEE 1991.** 91 ("Final List"): IEEE 1991 states of papers reviewed for its preparation, that, " Only those reports with adequate dosimetry were judged acceptable." Also evaluated were, "scientific quality and originality of the data, reliability...(and) reports embodying questionable statistical methods were evaluated further..." [IEEE 1991 pg. 27]. IEEE 1991 also states, "*most sensitive measures were based on disruption of ongoing behavior..*" [pg 27], "*disruption of a highly demanding operant task is between 3.2 and 8.4 W/kg (Watts of RF power absorbed per kilogram of body weight)*"(including for rodents [pg. 27], and, because the behavior disruption threshold in nonhuman primates was between 3.2 to 4 W/kg, based on 4 referenced studies [pg. 28], 4 W/kg was adopted as a working threshold [p.28]. For frequencies where SAR (specific absorption rate of RF power) is meaningful (.1 to 6000 MHz [IEEE 1991 pg. 22]:

Note: in () is the % the exposure is of the 4 W/kg considered as the 'threshold' for adverse effects by IEEE 1991.

5.1. 3.2 (80%) W/kg or less should be the threshold, since IEEE 1991 state studies found thresholds at this level. Applying statistical methods for estimating lower tolerance limits^{1,2} to the 4 studies used by IEEE 1991 would have given lower (more protective) limits. This would reduce exposure criteria to be no more than 80% of FCC limits.

5.2. 2.5 (62.5%) or less should be the threshold since the IEEE 1991 standard made an error in reporting that for the 4 studies referenced on page 28 of this standard that, "the disruption of ongoing behavior in nonhuman primates always exceeded a whole-body SAR of 3.2 to 4 W/kg." Rather, of these 4 studies, it is reported by the author of a study of squirrel monkeys³ that RF

exposures, "resulted in a threshold of 2.5 W/kg,"⁴ 62.5% of the 4 W/kg 'threshold' used by IEEE 1991. Applying this correct value would result in FCC power density exposure limits being 62.5% of their present value.

Studies in the IEEE Final List with adverse effects at exposure below 4 W/kg

Behavioral disruption:

5.3. At 2.3 W/kg (58%): *"The observed decrement in discriminative performance emerged immediately upon initiation of MW radiation."* (Mitchell et al, 1977)⁵

5.4. At an average of 2 W/kg (50%) "marked decrements of responding occurred" when animals were exposed at 28 Deg. C (82 Deg. F) (Gage et al., 1979).⁶

5.5. At an average of 1.6 W/kg (40%) "The results of our experiment show that intensity of microwave irradiation and ambient temperature interact to increase decrements in rates of behavioral responding measured at termination of irradiation." (Gage et al. 1982)⁷

5.6. At 1.2 W/kg (30%) *"The rat's ability to discriminate the appropriate (time interval to wait to get a food pellet) was disrupted...Results of the present study indicate, that at the same field strength, a PW (pulsed wave) field is more likely than a CW (continuous wave) field to affect temporal discrimination."* (Thomas et al. 1982)⁸

5.7. At 0.7 W/kg (18%) "Error responding was increased during most of the session..Produced alterations in 50% of the test sessions (learning a 4 step sequence of tasks) (Schrot et al, 1980)⁹

5.8 At 0.2 W/kg (rough approximation) (5%) Rats were given doses of dextroamphetamine used to treat Attention Deficit Disorder in children¹⁰, adolescents¹¹ and adults¹². *"The response rates were notably higher (too many responses) after microwave radiation.. even though the last*

exposure to radiation occurred 24 hours before the drug was administered," suggesting a cumulative effect of the irradiation. (Thomas et al, 1979)

Adverse effects (non-behavior) at exposures below 4 W/kg

5.9. At 2 to 3 W/kg (50% to 75%) Cancer acceleration: Injecting sarcoma cells in mice gave an average of 69% more sarcoma lung nodules in 3 months of RF exposure. (Szmigielski, 1982)¹³

5.10. At 2 to 3 W/kg (50% to 75%) Cancer acceleration: Placing skin carcinogen on mice already RF exposed 3 months resulted after 6 more months in 22 of 40 exposed mice having tumors, and 0 of 40 control mice with the skin carcinogen having tumors. (Szmigielski, 1982)¹³

5.11. At 2 to 3 W/kg (50% to 75%) Cancer acceleration: The midpoint for days of survival of breast tumor prone RF exposed mice was 20% less due to the exposure. (Szmigielski, 1982)¹³

5.12. At 2.3 W/kg (58%) The only difference was *"the mean frequency of such structural anomalies (myelin figures in cortical dendrite nerve cells) was approximately 3 times greater in irradiated as compared with nonirradiated tissue."* (Switzer, 1977)¹⁴ The affected animals were those in 14.4.1. Thus, anomalies of the cortex were associated with a behavioral disruption.

5.13. At 2 W/kg (50%) Fetal anomalies: *"The high rate of occurrence of cranioschisis (incomplete cranial development) seen in the irradiated fetuses and the consistency in which cranioschisis appeared in irradiated fetuses only is strongly suggestive that the application of microwaves was the cause.."* (Berman, 1978)¹⁵

Exposures with adverse effects that are below exposures reporting behavioral disruption:

5.14. At 0.01 W/kg⁹³ (0.25%) (30 μ W/cm²) Indications of breaching of the blood brain barrier. *"...complete functional loss of the tight junctions ...would result in cerebral edema, in*

increased pressure, and in irreversible brain damage...Perhaps it is coincidental, but the repetition rate of 5 pulses per second falls within the spectrum of intrinsic electrical rhythms of the brain." [NCRP, 1986] on (Oscar, 1977)¹⁶. No artifacts from temperature due to low power.

5.15. At 0.006 W/kg (approx.) (0.15%) Male rats at 2380 MHz (12.6 cm wave length) were exposed to power densities of 1000, 50, 25 and 10 $\mu\text{W}/\text{cm}^2$. *"Thus, it was determined that long-term exposure to NMR (nonionizing microwave radiation) with intensity of 1000 to 10 $\mu\text{W}/\text{cm}^2$ (3 times a day 40 minutes at a time, for 2 months) elicits changes in the ultrastructure of the hippocampus (of the brain)...The demonstrated changes can most probably effect their function and constitutes one of the elements of pathogenesis of early disturbances in people exposed to this environmental factor."* (Belokrinitskiy, 1982)¹⁷

IEEE Final List studies/references indicating the 10 mW/cm^2 power density at upper frequencies is too high - for studies below all frequencies were greater than 15 GHz

5.16. At 8.3 mW/cm^2 people are expected to feel 'very warm to hot' (Gandhi et al, 1986)¹⁸

5.17. At 1.7 mW/cm^2 on an arm people perceive warmth within 10 seconds. Longer or shorter durations of exposure ..are often associated with lower or higher thresholds.¹⁹

5.18. The ANSI Z136.1-1993 "Safe Use of Lasers" standard states that its limits, which include 10 mW/cm^2 for 300 GHz *"may be uncomfortable to view or feel upon the skin....maintain exposure levels as far below the (limit values) as is practicable."*²⁰

5.19. At 17 mW/cm^2 there was "muscular flaccidity or collapse (of chicks). At 20 mW/cm^2 there was mild hyperpyrexia below the frontal portion of a rat's skull. (10 mW/cm^2 of IEEE 1991 has a safety factor, if any, of less than 2 which is quite unusual²¹). (Deichman et al. 1959)²²

5.20. At 10 mW/cm^2 "induced significant leucocytosis, lymphocytosis, and neutrophilia ...Effects on erythrocytes, hemoglobin, and hematocrit differed in the three strains."²³

5. 21. IEEE 1991 reference [B26] recommended 1 mW/cm^2 for the general population.²⁴.

6. Also, there should be no delays in starting. Companies knew for over 3 years what would be. A database exists (Interactive Systems, Inc., Arlington, VA) which has the Commission database. With modification, needed information for all Commission licensees could be added.

Having a 'site' owner is next to impossible, since site owners may be persons who lease the space but have little technical skill. Also, antennas on independently owned sites will still create a problem. There must be an integrated database.

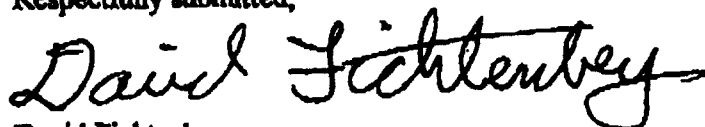
Delay will only mean development continues without any monitoring. This is not protecting the public health.

Footnotes:

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2. A. Bowker et al, "Statistical Tolerance Limits" in Chapter 8 Estimation, in *Engineering Statistics*, Prentice-Hall, Inc, 1972.
3. J.O. de Lorge, "Operant Behavior and Rectal Temperature of Squirrel Monkeys During 2.45 GHz Microwave Radiation," *Radio Science*, 14(6S), pp. 217-225, 1979
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5. D.S. Mitchell et al., "Hyperactivity and Disruption of Operant Behavior in Rats After Multiple Exposures to Microwave Radiation," *Radio Science*, 12(6S), pp.263-271, 1977
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8. J.R. Thomas et al, "Comparative Effects of Pulsed and Continuous-Wave 2.8 GHz Microwaves on Temporally Defined Behavior," *Bioelectromagnetics*, 3(2), pp.227-235, 1982.
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12. K.G. Nadeau, *A Comprehensive Guide to Attention Deficit Disorder in Adults*, fChapter 10:"Pharmacotherapy of Adult ADHD", published by Brunner/Mazel Publishers, New York, 1995
13. S. Szmigielski et al, "Accelerated Development of Spontaneous and Benzopyrene-Induced Skin Cancer in Mice Exposed to 2450 MHz Microwave Radiation," *Bioelectromagnetics*, 3(2), pp. 179-191, 1982.

14. W. Switzer et al, "Long Term Effects of 2.45 GHz Radiation on the Ultrastructure of the Cerebral Cortex and on the Hematologica Profiles of Rats," Radio Science, 12(6S), pp 287-293
15. E. Berman, "Observations of Mouse Fetuses After Irradiation with 2.45 GHz Microwaves," Health Physics, 35, pp. 791-801, 1978
16. K. Oscar et al., "Microwave Alteration of the Blood-Brain Barrier System in Rats," Brain Research, 126, pp. 281-193, 1977
17. V. Belokrinitskiy, "Destructive and Reparative Processes in Hippocampus with Long Term Exposure to Nonionizing Microwave Radiation," in U.S.S.R. Report, Effects of Nonionizing Electromagnetic Radiation, No. 7, JPRS 81865, pp. 15-20, Sept. 27, 1982.
18. O.P. Gandhi et al, "Absorption of Millimeter Waves by Human Beings and its Biological Implications," IEEE Transactions on Microwave Theory and Techniques MTT-34(2), pp.228-235
19. Justesen, D. et al., "A Comparative Study of Human Sensory Thresholds: 2450 MHz Microwaves vs Far-Infrared Radiation," Bioelectromagnetics, 3(1), pp.117-125, 1982.
20. American National Standards Institute Standard ANSI Z136.1-1993, Section 8.0, previous version is ANSI Z136.1-1986
21. Federal Register Vol. 51. No. 146, July 30, 1986, EPA Federal Radiation Protection Guidance: Proposed Alternatives for Controlling Public Exposure to RF Radiation: Notice of Proposed Recommendations:pp. 27317-27339
22. W.R. Deichman, "Acute Effects of Microwave Radiation on Experimental Animals (24,000 MHz), Journal of Occupational Medicine, 1,pp.369-381, 1959
23. W.R. Deichman, "Effect of Microwave Radiation on the Hemopoietic System of the Rat," Toxicology and Applied Pharmacology, 6(1), pp.71-77
24. O.P. Gandhi, "Advances in Dosimetry of Radiofrequency Radiation and Their Past and Projected Impact On The Safety Standards," in Proceedings of IMTC Instrumentation and Measurement Technology Conference, April 20-22, 1988, San Diego, CA, pp. 109113, 1988, and in IEEE 1991 as reference [B26]

Respectfully submitted,



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Telephone: (206) 722-8306

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 8, 1996.



David Fichtenberg

Submitting one original and fourteen copies to the Secretary, Federal Communications Commission, 1919 M Street, N.W., Room 222, Washington D.C., 20554



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 8 1996

OFFICE OF
AIR AND RADIATION

David Fichtenberg
P.O. Box 7577
Olympia, WA 98507-7577

Dear Mr. Fichtenberg:

Thank you for your E-mail letter of October 2, 1996, that asks for clarification of a statement in the letter (July 25, 1996) from Environmental Protection Agency (EPA) Administrator Carol M. Browner to Federal Communications Commission (FCC) Chairman Reed E. Hundt. You request explanation of the statement, "this new approach is consistent with our comments made in 1993 and addresses our concerns about adequate protection of public health," with questions that pertain to acute thermal exposures, long-term (chronic) nonthermal exposures, and specific absorption rate (SAR).

The aforementioned letter was a response to a Mr. Hundt's request (July 1, 1996) that EPA review the FCC's approach to developing new guidelines. The EPA discussion of the original FCC Notice of Proposed Rulemaking, "Guidelines for Evaluating the Environmental Effects of Radio frequency (RF) Radiation, ET Docket No. 93-62," resulted in recommendations to the FCC (November 9, 1993). One of those recommendations was that the FCC adopt the exposure criteria recommended by the National Council on Radiation Protection and Measurements (NCRP) in NCRP Report No. 86, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," instead of the 1992 ANSI/IEEE standard that was originally proposed.

The FCC concluded its rule-making activity in August 1996, and adopted RF radiation exposure limits that are generally based on the NCRP guidelines as was recommended by EPA. In addition the FCC specified (in the introduction to its Report and Order FCC 96-326) that the maximum permissible exposure limits adopted are based on exposure criteria quantified in terms of specific absorption rate, and that the SAR limit is 4 watts per kilogram (W/kg).

EPA was very specific in our 1993 comments regarding the sufficiency of available information (on the health effects of RF radiation) to provide a basis for developing exposure standards. In the context of those comments, the FCC's resulting rule that generally followed the NCRP guidelines, and the FCC's explicit statement that the limits adopted are based on the SAR limit of 4 W/kg, EPA believes that our concerns about adequate protection of public health were addressed by the FCC. The FCC does not claim that their new exposure guidelines provide protection for effects to which the 4W/kg SAR basis does not apply.

A key conclusion of EPA's Radio frequency Radiation Conference, April 1993 (see "Summary and Results of the April 26-27, 1993, Radio frequency Radiation Conference," Vol. I: Analysis of Panel Discussions, EPA Report 402-R-95-009, March 1995) is that "There is sufficient information on thermal exposure/effects on which to base a standard. However, participants generally felt that more information needs to be obtained on nonthermal effects." This is reflected in EPA's November 1993 comments to the FCC. These include the following:

"While studies continue to be published describing biological responses to nonthermal ELF-modulated RF radiation, the effects information is not yet sufficient to be used as a basis for exposure criteria to protect the public against adverse human health effects."

"It is clear that the adverse effect threshold of 4 W/kg is based on acute exposures (measured in minutes or a few hours) that elevate temperature in laboratory animals including nonhuman primates, and not on long-term, low-level (non-thermal) exposure. Only a few chronic exposure studies of laboratory animals and epidemiological studies of human populations have been reported. The majority of these relatively few studies indicate no significant health effects are associated with chronic, low-level exposure to RF radiation. This conclusion is tempered by the results of a small number of reports suggesting potentially adverse health effects (cancer) may exist (...).

"The thesis that the 1992 ANSI/IEEE recommendations are protective of all mechanisms of interaction is unwarranted because the adverse effects level in the 1992 ANSI/IEEE standard is based on a thermal effect."

"While there is general, although not unanimous, agreement that the data base on low-level, long-term is insufficient to provide a basis for standards development, some contemporary guidelines state explicitly that their adverse-effect level is based on an increase in body temperature (NRPB 1993). Furthermore they do not claim that the exposure limits protect against both thermal and nonthermal effects."

With this background established, I will proceed to provide my responses to your other questions.

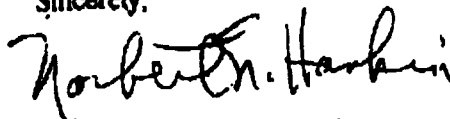
- Q. Is it correct to conclude that the "adequate protection of public health" noted above, refers to "protecting against thermally related effects in humans?"
- A. As I have previously noted, while there is sufficient information on thermal exposure/effects on which to base a standard, the data base on low-level, long-term exposure is insufficient to provide a basis for standards to protect the public against adverse human health effects that may result from long-term, nonthermal exposures. Both the NCRP and ANSI/IEEE standards are thermally based, and do not apply to chronic, nonthermal exposure situations. The statement referring to "adequate protection" pertains to thermally related effects.

3

- Q. Is it still correct that adverse effect level of 4 W/kg is based on acute exposures that elevate temperature in laboratory animals including nonhuman primates, and not on long-term, low-level (non-thermal) exposure.
- A. Yes
- Q. Is it correct that the "adequate protection" EPA refers to in its July 25, 1996 letter pertains to protection provided for the effects which occurred due acute exposures, and not necessarily to effects reported to occur below the 4W/kg threshold level?
- A. We are referring to exposures that are acute, thermal exposures, not non-thermal, chronic exposures. The SAR limit to which the whole-body exposure limits for the public are related is 0.08 W/kg due to the use of a factor of 50 uncertainty factor applied to the 4 W/kg basis.
- Q. Is it correct that "adequate protection" of public health: pertains to thermally related health effects, and not necessarily to the nonthermal effects noted in the 1993 EPA letter?
- A. Yes
- Q. In view of 1993 comments, does adequate protection pertain to microwave hearing?
- A. In that the 'microwave hearing effect' has not been established as a health effect, our statement with regard to "adequate protection" would not pertain to microwave hearing.

I hope that this information has been helpful and responsive to your inquiry. Please contact me if I can be of further assistance.

Sincerely,



Norbert N. Hankin (6604J)
Indoor Environments Division
Office of Radiation and Indoor Air
Environmental Protection Agency
Washington, D.C. 20460
Tel: (202) 233-9235
Fax: (202) 233-9650

04/15/91

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TEL NO:

#747 P06

CDRH/OST/DLS

0005/003

04/17

FOR ACTION

Letter Ballot
of IEEE Standards Coordinating Committee, SCC22
to be submitted for
Approval of the Revision of ANSI Standard C35.1-1982.
Draft dated July 1990

American National Standard *Safety Levels with Respect to Human
Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*

Please return this ballot **NO LATER THAN .. April 15, 1991**

_____ Approve (Affirmative) for IEEE Standard; comments on reverse or attached.

☒ Disapprove (Negative) for reasons given on reverse or attached.
(Note: In accordance with 3.7(c) of the IEEE Standards Manual, this vote must be accompanied by specific reasons in sufficient detail that the specific wording of the changes that will cause the negative voter to change the vote to "Approve" can readily be determined. In the absence of a reason for a negative vote after follow-up inquiry, the ballot shall be classified as "no response.")

An abstention vote must be accompanied with the reason for abstaining; without a reason, an abstention will be classified as an unreturned ballot.

_____ Abstain for lack of time to review document.

_____ Abstain for lack of expertise.

_____ Abstain for _____

Voter Name: (Please type)

MAYS L SWITZER

Date:

4/15/91

Signature:

[Handwritten Signature]

Phone No.:

301-443-7150

Address:

FDA - HF2114

5100 FISHERS LANE

ROCKVILLE, MD 20857

Return this original ballot (and comments) to:

R. C. Peterson
AT&T Bell Laboratories
Room 1F101C
400 Mountain Ave.
Murray Hill, NJ 07974
908-582-6442

04/18/81 17:21 301 443 7210

TEL NO:

H747 P87

CDNH/OST/DLS

002/003

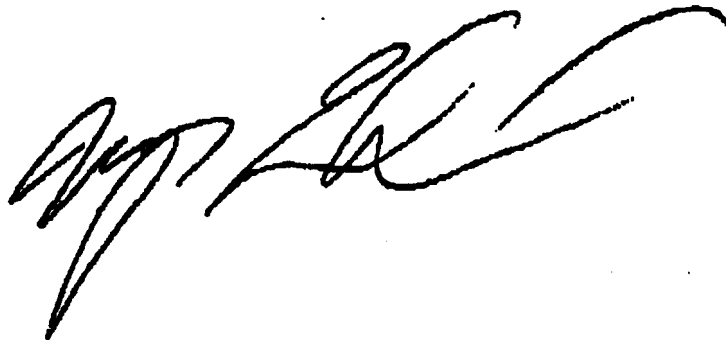
Four reasons for rejecting the standard are as follows.

1. I feel that the procedures agreed upon concerning membership and circulation of this document have not been fully carried out. A membership committee was appointed to consider a proper balance of representatives. To my knowledge this committee has not met. It is generally recognized that the current membership is not balanced in representing government, industry and the general public. Thus the ballot may not represent a proper balance. Secondly, we agreed at the fall meeting in 1989 to send out this document for agency review and comment. The second point may be considered minor but if the standard is to have credibility I feel it is necessary.

2. The inconsistency of the exclusion clause with the basic standard.

3. Little attention has been paid to appropriate averaging time. The standard still uses 6 minutes for frequencies below 15 GHz. Six minutes was arbitrarily chosen and has no significance in terms of thermal loading to cells or any other biological response. There is some work by Nachtal which suggest some maximum values for consideration. There is other data (work of Kues and others) which suggest that pulsed microwaves may give responses at lower average levels than CW. This problem should not be brushed aside.

4. The standard has been increased at the higher frequencies from the 1982 versions with very weak justification. There is the statement that this is a standard for the work place and does not include children. However, there are small adults. The factor of two is nothing to be concerned with. However, the appearance of arbitrarily increasing the level for practical engineering considerations with no health consideration will cause undue public concern of the committees actions. The justification should be strong and make sense or the values should be reduced to 1982 levels.

A large, stylized handwritten signature in black ink, appearing to be 'J. L. K.' or similar, is written across the bottom right of the page.

04.30.91 07:24 AM MOSR WHITE

P08

UNRESOLVED
NEGATIVE
VOTES

FOR ACTION

Letter Ballot
of IEEE Standards Coordinating Committee, SC02
is to be submitted for
Approval of the Revision of ANSI Standard C95.1-1990,
Draft dated July 1990

**American National Standard Safety Levels with Respect to Human
Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz**

Please return this ballot NO LATER THAN .. April 15, 1991

____ Approve (Affirmative) for IEEE Standards documents on reverse or attached.

☒ Disapprove (Negative) for reasons given on reverse or attached.
When in accordance with 2.7.2 of the IEEE Standards Manual, this vote can be accompanied by specific reasons
in addition to the specific wording of the standard that will cause the negative vote to change the vote to
"Approve" can readily be determined. In the absence of a reason for a negative vote after follow-up inquiry, the
ballot shall be classified as "no response."

An abstention vote must be accompanied with the reason for abstaining; without a reason, an abstention
will be classified as an unreturned ballot.

____ Abstain for lack of time to review document.

____ Abstain for lack of expertise.

____ Abstain for _____

Voter Name: (Please type) M.R. Altman, PhD Date: 30 April 91

Signature: _____ Phone No.: _____

Address: _____

Return this original ballot (and comments) to:

R. C. Fournier
AT&T Bell Laboratories
Room 1F101C
600 Mountain Ave.
Murray Hill, NJ 07974
908-582-6442
908-582-7874 (Fax)

See comments of Dr. Mays Swicord
of FDA.



BALLOT SUMMARY

IEEE Project No. CBS-1

SPONSOR: SCC-28

BALLOTING COMMITTEE: SCC-28

DATE 05-14-91

NAME	COMPANY	Classification			Voted				Not Rec.
		*	*	*	Yes	No	Abstain	Not Rec.	
Altman, M.R.	FDA/CDRH			R		X			
Baird, R.C.	NIST			AR	X				
Balsano, G.	Motorola			TC	X				
Barron, W.	Dept. of Navy			A	X				
Brandinger, J.	David Sarnoff			AR	X				
Budinger, T. P.	Lawrence Berkeley Labs			AR	X				
Caine, S.	Dept. of Navy			A					X
Case, D.R.	Dept. of the Air Force			A	X				
Cohan, J.	Jules Cohen Assoc.			C	X				
Deeter, D.F.	Dept. of the Army			A	X				
Delorge, J.O.	Dept. of the Navy			BR	X				
Durham, M.O.	U. of Tulsa			GI	X				
Elson, E.C.	Dept. of the Army			BR	X				
Erwin, D.N.	Dept. of the Air Force			BR	X				X
Fantossi, G.U.	Florida PAL			TC					
Guy, W.A.	U. of Washington			BR	X				
Haimer, G.	Consultant			C	X				
Hicks, C.W., Jr.	Dept. of the Army			A	X				
Hover, T.	Dept. of the Air Force			A					X
Kerschner, H.F.	Dept. of the Navy			A	X				
Lin, J.C.	U. of Illinois			BR	X				
Maher, E.E.	Dept. of the Air Force			AR	X				
McDermott, T.J.	NY Power Auth.			UN	X				
Mitchell, J.C.	Dept. of the Air Force			AP	X				
Osephchuk, J.M.	Raytheon Research			TC	X				
Petersen, R.C.	AT&T Bell Labs			TC	X				
Roberts, B.	Dept. of the Army			A	X				
Ross, R.	Dept. of the Navy			A	X				
Schwann, H.P.	U. of PA			BR	X				
Spaulding, N.E.	Houston PAL			UN	X				
Stuele, J.A.	Dept. of the Army			A					X

Notes:

Not Returned - No ballot received after second request.

* See attached sheet for rejections